

Remarks

As set forth in the Office Action at pages 2 and 3, the Examiner has issued a restriction on the grounds that the present application has two classes of inventions, Class I including claims 1-29 and 34-39, and Class II including claims 30-33. Applicant hereby confirms the election of claims 30-33 made provisionally with traverse in a telephone conference on February 26, 2004, and Applicant hereby withdraws from consideration claims 1-29 and 34-39 without prejudice to renew.

As set forth in the Office Action, claims 30-32 stand rejected under 35 U.S.C. § 102(b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as being obvious over Myer et al., U.S. Patent No. 5,118,434. Claims 30-32 also stand rejected under 35 U.S.C. § 102(b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as being obvious over Maes et al., U.S. Patent No. 5,366,651. Claims 30-34 stand rejected under 35 U.S.C. § 102(b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as being obvious over Hansen, U.S. Patent No. 4,728,452. Applicant notes that claims 30-33 were elected by Applicant, and Applicant assumes that Examiner mistakenly referred to rejection of claim 34 in the Office Action.

Claim 30 has been amended to clarify that the claimed method is used to reduce the toxicity of an ethylene glycol based, non-aqueous heat transfer fluid. Claim 40 has been added to claim an embodiment of the invention wherein at least 1 percent by weight of propylene glycol is added to the ethylene glycol based heat transfer fluid. Support for the amendment to claim 30 and for new claim 40 may be found, for example, at page 16-17, 24 and 29. No new matter has been added.

As set forth in claims 30-33 as amended and new claim 40, the present invention is directed to a method to reduce the oral toxicity of an ethylene glycol based, non-aqueous heat transfer fluid. A polyhydric alcohol that acts as an ADH enzyme inhibitor

is added to the ethylene glycol based, non-aqueous heat transfer fluid. As recited in claim 31, in one embodiment of the invention, at least 1 percent by weight of the polyhydric alcohol ADH enzyme inhibitor is added to the ethylene glycol based heat transfer fluid. As recited in claims 32, 33 and new claim 40, in certain embodiments of the invention, the ADH enzyme inhibitor may be propylene glycol or glycerol.

As described in the specification at, inter alia, pages 11-14 and as recited in the amended claims, the method of the present invention results in a non-aqueous heat transfer fluid which is used without the addition of any water. Water is not used in the fluid as a means of heat transfer, and is only present, if at all, in small amounts as an impurity. As described in the specification at, inter alia, pages 17-20, the heat transfer fluids of the mixtures described in the present application exhibit the necessary physical properties, such as, for example, viscosity and vapor pressure, to function effectively in most applications. Moreover, as described in the specification at, inter alia, pages 20-26, the method of the present invention results in a non-aqueous heat transfer fluid which unexpectedly exhibits a reduced oral toxicity than would be predicted based upon the oral toxicity of the major components, such as ethylene glycol or propylene glycol.

The Examiner's rejections under 35 U.S.C. § 102(b) and § 103(a) are respectfully traversed based upon the clarifying amendments to the claims described above. As set forth in detail below, the claims as amended are patentable over the prior art references cited by the Examiner under both 35 U.S.C. § 102(b) and 35 U.S.C. § 103. The references cited by the Examiner describe aqueous solutions which can include ethylene glycol as a component. None of the references describe, or teach or suggest, combining an ADH enzyme inhibitor, such as for example propylene glycol or glycerol, with an ethylene glycol based, non-aqueous heat transfer fluid as set forth in the amended claims. Moreover, none of the references cited by the Examiner describe, or teach or suggest,

combining an ethylene glycol based, non-aqueous heat transfer fluid with an ADH enzyme inhibitor in any specific proportions, much less the proportions set forth in amended claim 31 and new claim 40.

Meyer, U.S. Patent No. 5,118,434 describes deicing solutions comprising alkylene glycols, water, corrosion inhibitors, and one or more polymeric additives. Meyer states at Column 2, lines 58-61 that the composition contains “up to 50 percent water” and preferably between 1 and 10 percent water by weight. The composition described by Meyer is intended to prevent precipitation of materials contained in the composition, and precipitation of materials contained in water that may be mixed with the composition.

The composition described in Meyer requires the presence of water to maintain the additives described therein in solution. Indeed, Meyer states at Col. 2, lines 59-61 that the composition preferably contains between about 1 and 10 percent by weight water. As clarified in the new and amended claims, and as described in the specification, the composition of the present invention is non-aqueous, which is defined in the specification as meaning that there is no added water, and that water is present only as an impurity. The only additives present in the fluids formed by the method of the present invention are soluble in ethylene glycol and the ADH enzyme inhibitor, such as propylene glycol or glycerol. Meyer does not describe, and does not teach or suggest, a method to reduce the toxicity of a non-aqueous ethylene glycol based fluid as recited in the new and amended claims. Moreover, Meyer does not describe, or teach or suggest, combining ethylene glycol containing fluids with propylene glycol or glycerol in any specific proportions, much less the specific proportions set forth in claims 31 and 40.

Maes is directed to a corrosion inhibitor for use in aqueous solutions, and to antifreeze/coolant compositions containing such a corrosion inhibitor. See Maes at Col. 1, line 8. Maes states that the invention described therein “is directed to a novel corrosion inhibitor composition for use in aqueous systems, an antifreeze/coolant concentrate containing the inhibitor composition and aqueous antifreeze/coolant compositions containing the inhibitor composition.” See Maes at Col. 2, lines 54-58. Thus, Maes is directed primarily toward the corrosion inhibitor used in aqueous antifreeze/coolants. As set forth in the Maes specification and the claims, Maes describes a fluid for use in aqueous solution comprising “a water soluble liquid alcohol freezing point depressant and a corrosion inhibitor comprising carboxylic acids or their salts and a triazole compound” Maes at Col. 2, lines 62-65 (emphasis added). See also Maes at Col. 9, lines 25-26 (claim 1 directed to a concentrate comprising “a water soluble freezing point depressant”) (emphasis added). Accordingly, Maes describes a composition having a single water soluble liquid freezing point depressant.

Maes does not teach or suggest combining ethylene glycol with an ADH enzyme inhibitor such as propylene glycol or glycerol for any purpose, much less for the purpose of forming a non-aqueous heat transfer fluid having reduced toxicity. The Examiner’s erroneous reading of Maes is based entirely on a single sentence at Col. 3, line 65 to Col. 4, line 8. In this sentence, however, Maes does not suggest combining two or more liquid alcohol freezing point depressants. Rather, Maes is merely listing alcohol freezing point depressants which may be used as the major component in the aqueous antifreeze compositions described in Maes. The sentence cited by the Examiner does not teach or suggest combining ethylene glycol with a second diol for any purpose, much less to form a non-aqueous, reduced toxicity heat transfer fluid as described in the present application and claimed in amended claims 30-33 and new claim 40.

The Examiner's erroneous reading of Maes is a result of reading one sentence in the specification out of context. A rejection under 35 U.S.C § 103 cannot be based on a single sentence taken out of context without considering the remainder of the specification. The Courts have held that "it is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." In re Wesslau, 353 F.2d 238, 147 U.S.P.Q. 391 (CCPA 1965).

In Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc., 796 F.2d 443, 230 U.S.P.Q. 416 (Fed. Cir. 1986), cert. denied, 484 U.S. 823 (1987), the Federal Circuit reversed a finding of obviousness based on a hindsight analysis based upon a single sentence in a reference taken out of context. The Court stated that the sentence in the reference had to be read in context. The Court held that it was improper hindsight analysis to take a single line from the reference and view that single line in light of the teaching of the patent at issue to find obviousness. Id. at 448-49.

In the sentence cited by the Examiner at column 3, line 65 through column 4, line 8, Maes provides a listing of water-soluble alcohols that may be used in the invention. Maes refers to "depressants" in the plural only in the context of introducing the listing of substances "which can be employed as major components in the present composition". Col. 3, line 68 to Col. 4, line 1. Maes does not teach or suggest using combinations or mixtures of more than one alcohol freezing point depressant. For example, in the sentence cited by the Examiner, Maes does not state that combinations or mixtures of the listed substances could be used in the compositions described in the patent.

Moreover, throughout the specification and claims, Maes refers solely to the use of a single water-soluble liquid alcohol freezing point depressant as the major component

in the anti-freeze compositions described therein. All of the 16 examples provided by Maes contain only ethylene glycol as the alcohol freezing point depressant. Col. 5, line 3 to Col. 6, line 54. In claim 1, the only independent claim in Maes, the composition is described as containing “a water soluble alcohol freezing point depressant.” (emphasis added). Accordingly, when the specification and the claims are read as a whole, it is plain that Maes teaches only the use of a single alcohol freezing point depressant in the composition described in Maes.

In this case, the Examiner has engaged in precisely the type of improper hindsight analysis rejected by the Court in Bausch & Lomb, Inc. The Examiner has based the rejection upon a single sentence from a reference taken out of context, and viewed that line in light of the teaching of the present application regarding the combination of ethylene glycol and a second diol to support a finding of obviousness. When considered as a whole, the Maes reference clearly describes only the use of a single glycol as a major component of the antifreeze formulation described therein.

Maes does not describe, and does not teach or suggest a method to reduce the toxicity of ethylene glycol based fluids by adding an ADH enzyme inhibitor, such as propylene glycol, to form a heat transfer fluid having reduced oral toxicity as set forth in the methods of amended claims 30-33 and new claim 40. Moreover, Maes does not describe, or teach or suggest, combining ethylene glycol containing fluids with propylene glycol or glycerol in any specific proportions, much less the specific proportions set forth in claims 31 and 40.

Hansen, U.S. Patent No. 4,728,452 describes coolant compositions for use in aqueous coolant systems. Col. 1, lines 7-10. The compositions include water soluble corrosion inhibitors to reduce corrosion of metal surfaces in the cooling system using aqueous coolants. Col. 2, lines 24-57. Although Hansen describes the use of alcohol or

glycol freezing point depressants in coolant concentrates, even in these solutions, the aqueous concentrates contain no more than 90% alcohol or glycol in an aqueous concentrate, meaning that at least 10% water is present. Col. 3, lines 29-35. Hansen does not describe, or teach or suggest, combination of any alcohols or glycols to reduce toxicity of the resulting concentrate, much less combination of an ADH enzyme inhibitor such as propylene glycol or glycerol with an ethylene glycol based, non-aqueous heat transfer fluid as recited in amended claims 30-33 and new claim 40. Moreover, Hansen does not describe, or teach or suggest, combining ethylene glycol containing fluids with propylene glycol or glycerol in any specific proportions, much less the specific proportions set forth in claims 31 and 40.

To anticipate a claim under 35 U.S.C. § 102(b), each and every element of the claimed invention must be found in a single prior art reference. MPEP § 2131. As set forth in detail above, none of the references cited by the Examiner describe a method for reducing the toxicity of an ethylene glycol based, non-aqueous heat transfer fluid by adding an ADH enzyme inhibitor as recited in the amended claims. Meyer, Maes and Hansen describe water based fluids. Maes does not describe combination of any two fluids, much less the combination of an ethylene glycol based, non-aqueous heat transfer fluid with an ADH enzyme inhibitor such as propylene glycol or glycerol as set forth in the amended claims. Moreover, none of the reference cited by the Examiner describe addition of propylene glycol or glycerol to an ethylene glycol based, non-aqueous heat transfer fluid in the proportions set forth in amended claim 31 or new claim 40. Accordingly, for at least these reasons, none of Meyer, Maes or Hansen describe each and every element of claims 30-33 and 40 as amended, and these claims are patentable over the references cited under 35 U.S.C. § 102(b).

The claims as amended are also patentable over the references cited by the Examiner under 35 U.S.C. § 103. Meyer, Maes and Hansen describe water based fluids. Maes does not describe combination of any two fluids, much less the combination of an ethylene glycol based, non-aqueous heat transfer fluid with an ADH enzyme inhibitor such as propylene glycol or glycerol as set forth in the amended claims. As discussed in detail above, none of the cited references teach or suggest a method to reduce the toxicity of an ethylene glycol based, non-aqueous heat transfer fluid by addition of an ADH enzyme inhibitor such as propylene glycol or glycerol as recited in the amended claims. Accordingly, the amended claims are not obvious in view of the references cited by the Examiner for at least this reason.

Moreover, none of the references teach or suggest combining an ethylene glycol based heat transfer fluid with the specific proportions of propylene glycol or glycerol recited in claims 31 and 40. As set forth in the specification, the present inventors discovered that adding an ADH enzyme inhibitor such as propylene glycol or glycerol in the proportions recited in claims 31 and 40 to an ethylene glycol based, non-aqueous heat transfer fluid unexpectedly reduced the toxicity of the resulting fluid below the level that would have been predicted based on the properties of the individual fluids. None of the references cited by the Examiner teaches or suggests combining an ADH enzyme inhibitor with ethylene glycol in any specific proportions, much less in the proportions set forth in claims 31 and 40.

As set forth in the specification at pages 20-26, the Applicants discovered that addition of at least 1 percent of an ADH enzyme inhibitor such as propylene glycol or glycerol unexpectedly reduced the oral toxicity of non-aqueous, ethylene glycol-based heat transfer fluids. Where as here a claimed range achieves unexpected results, the

claimed range is patentable over the prior art. In re Woodruff, 919 F.2d 1575 (Fed. Cir. 1990); MPEP § 2144.05. Accordingly, claims 31 and 40 are patentable under 35 U.S.C. § 103 over the references cited by the Examiner for at least this additional reason.


In view of the foregoing remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes after considering these remarks, that the application is not in condition for allowance, the Examiner is requested to call the Applicant's attorney at the telephone number listed below.

Because the reasons above are sufficient to traverse the rejection, Applicants have not explored, nor do they now present, other possible reasons for traversing such rejections. Nonetheless, Applicants expressly reserve the right to do so, if appropriate, in response to any future Office Action.

A petition for a two month extension of time and associated fee extending the time to respond to Office Action from June 16, 2004 to August 16, 2004 has been filed herewith. No additional fee is believed to be required. However, if an additional fee is required or otherwise necessary to cover any deficiency in fees paid, authorization is hereby given to charge our Deposit Account No. 50-1402.

Respectfully submitted,

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